

No. 689,332.

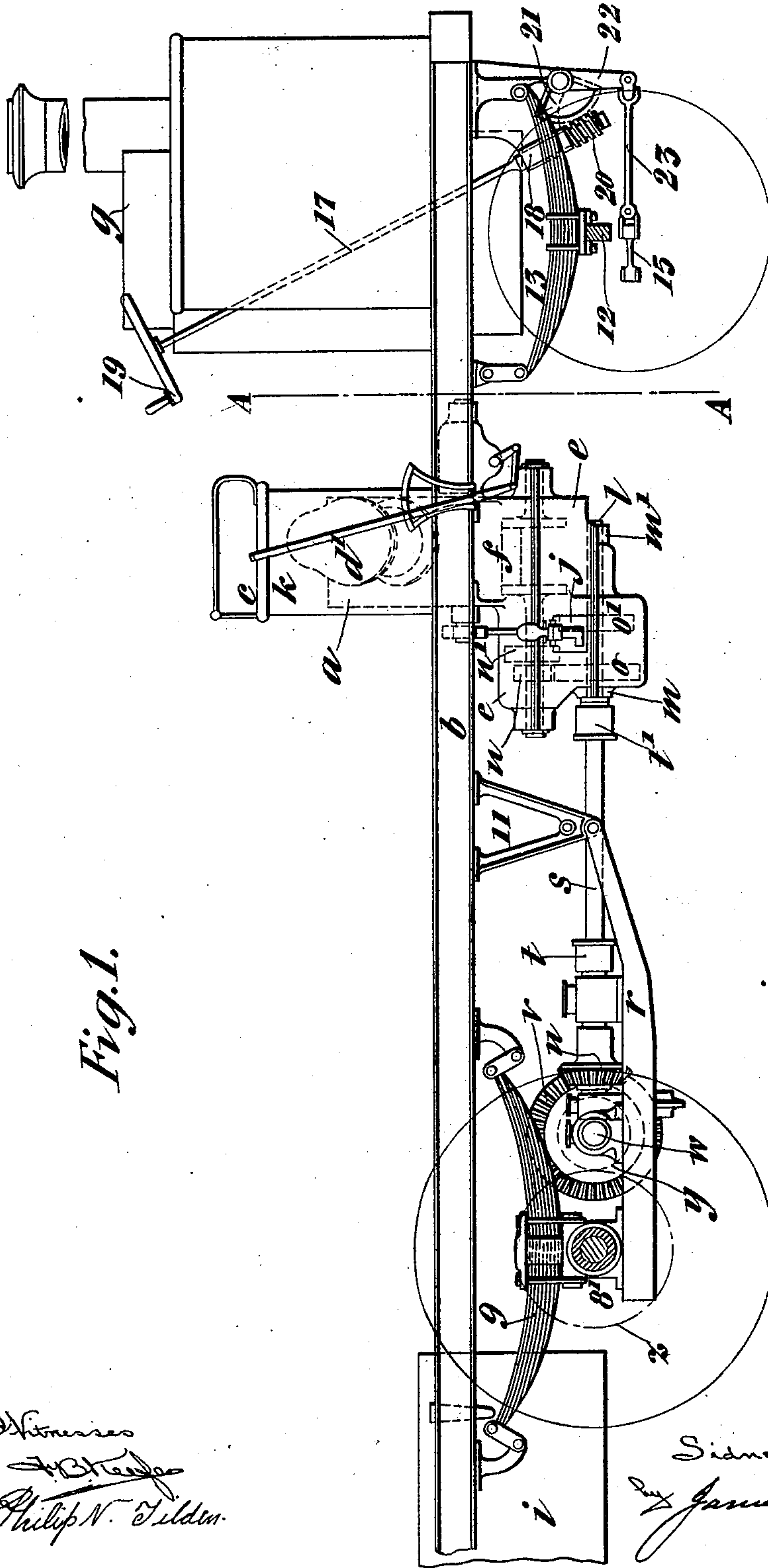
Patented Dec. 17, 1901.

S. STRAKER.  
STEAM PROPELLED VEHICLE.

(Application filed Oct. 5, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses  
J. B. Tilden  
Philip N. Tilden.

Inventor  
Sidney Straker  
By James L. Norris  
att'y

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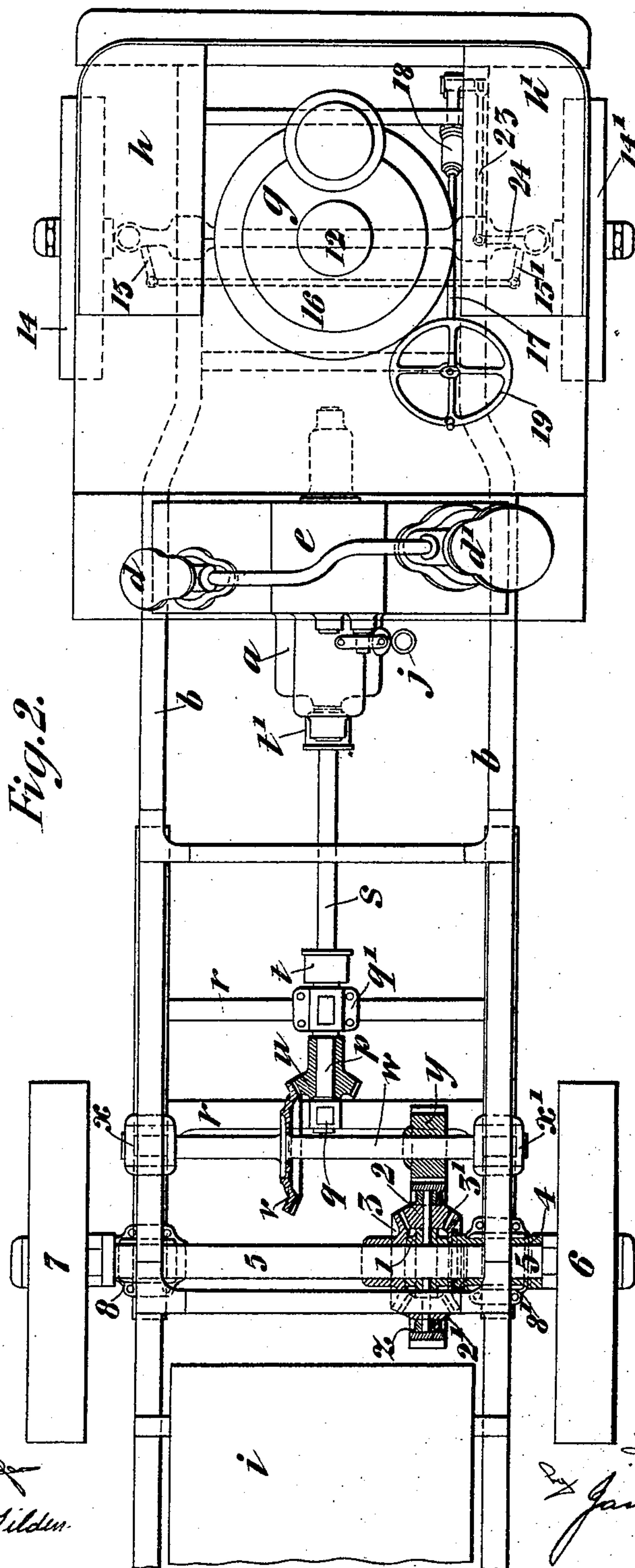
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**3 Sheets—Sheet 2.**



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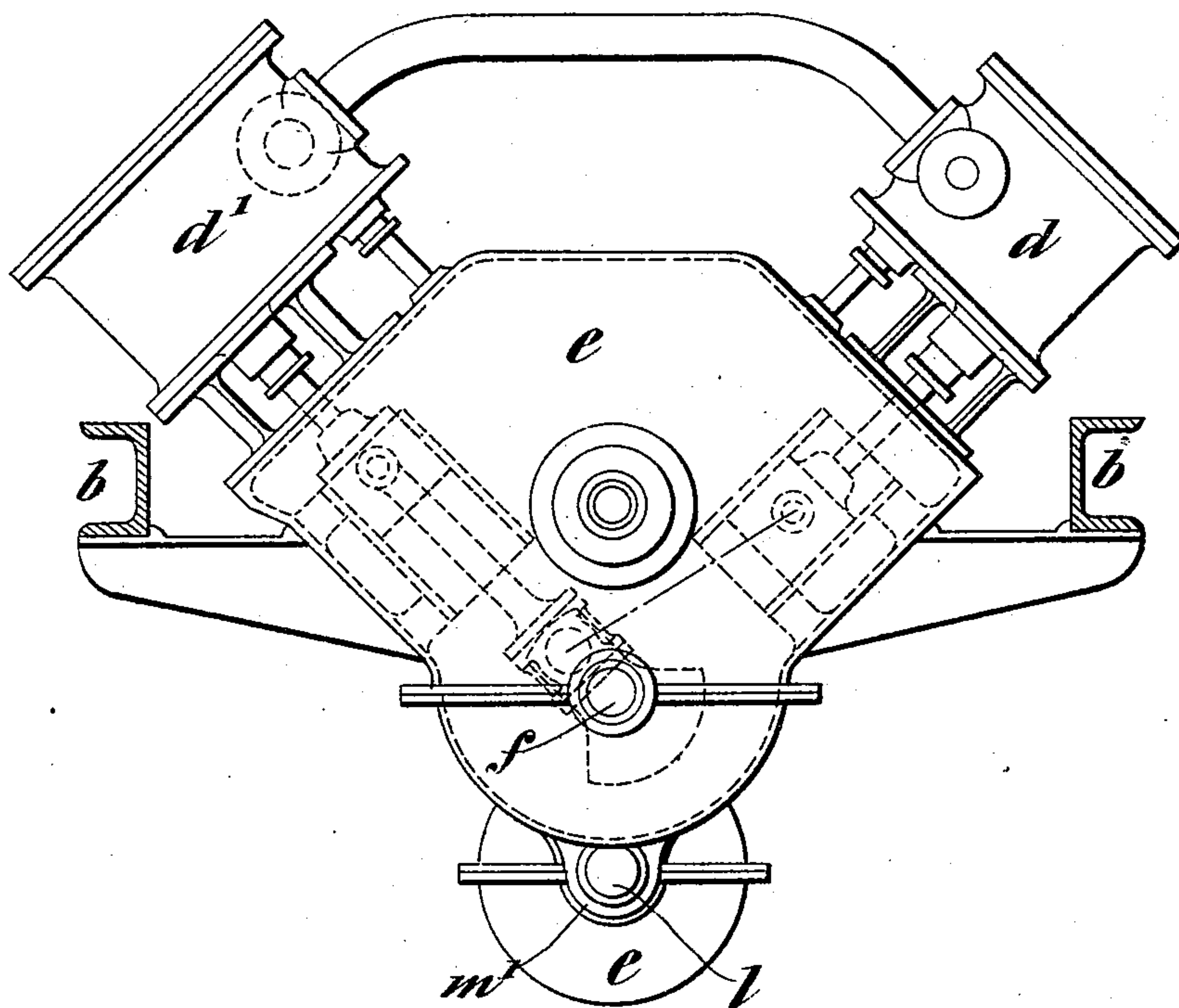
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3 Sheets—Sheet 3.

*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

SIDNEY STRAKER, OF LONDON, ENGLAND.

## STEAM-PROPELLED VEHICLE.

SPECIFICATION forming part of Letters Patent No. 689,332, dated December 17, 1901.

Application filed October 5, 1901. Serial No. 77,707. (No model.)

*To all whom it may concern:*

Be it known that I, SIDNEY STRAKER, civil engineer, a citizen of England, residing at 9 Bush Lane, in the city of London, England, have invented certain new and useful Improvements in Road-Vehicles Propelled by Steam, (for which I have applied for a patent in Great Britain, dated January 21, 1901, No. 1,325,) of which the following is a specification.

In steam-motor vehicles where the motor is placed in the forward part of the vehicle and under the driver's seat considerable disadvantage exists owing to the space of the vehicle occupied lengthwise by the motor, which detracts from the space available for carrying a useful load and extends the total length of the vehicle beyond the desirable limit.

According to my invention I employ an arrangement of compound steam-motor in which the center lines of the high and low pressure cylinders are arranged diagonally, making an angle of ninety degrees with each other, the two connecting-rods being connected to one crank, so that the action is that of an engine working with two cranks at right angles to each other. This construction gives the advantages of cheap construction, accessibility, and narrow width of engine.

In the accompanying drawings, Figure 1 is an elevation, and Fig. 2 is a plan, of the underframe of a steam-motor according to this invention. Fig. 3 is a section on the line A A, drawn to a larger scale and showing a front elevation of the steam-motor.

I fix the steam-motor *a* on the frame *b* under the driver's seat *c*, the crank-shaft being arranged lengthwise of the vehicle. The steam-motor has high and low pressure cylinders *d d'*, fixed to a crank-casing *e*, which has bearings for the crank-shaft *f*. The steam-generator *g* is fixed on the front portion of the frame and may have fuel-bunkers *h h'* each side of it. A water-tank *i* is fixed to the back part of the frame, the water being fed from it into the boiler by a feed-pump *j*, driven by the steam-motor.

A driver's lever *k* controls the starting, stopping, and reversing gear of the motor.

The power developed by the motor is transmitted to the driving-wheels of the vehicle in

the following manner: On the rear part of the crank-shaft *f* are fitted to slide on and turn with the shaft two toothed pinions *n n'* of different diameters, each of which by means of a lever worked by the driver can be slid into and out of gear with toothed wheels *o o'* of different diameters, fixed on a counter-shaft *l*, which is journaled in bearings *m m'*. This gearing is inclosed in a rearward extension of the crank-casing *e*.

Through a connecting-shaft *s* and two universal joints *t t'* the shaft *l* drives the shaft *p*, which is carried in bearings *q q'*, fixed to an underframe *r*, and has on it a bevel-pinion *u*, gearing with a bevel-wheel *v*, fixed on a transverse counter-shaft *w*, which rotates in bearings *x x'* on the sides of the underframe *r*. The shaft *w* has on it a toothed pinion *y*, which gears with the teeth of the middle wheel *z* of a differential gear; the bevel-toothed pinions *2 2'* of which gear with bevel-wheels *3 3'*, the one, *3*, on the axle *5* and the other, *3'*, on a sleeve *4*, which is free on the axle *5*, and has its outer end fixed to the one driving-wheel *6*, the other driving-wheel *7* being fixed on the end of axle *5*.

The axle *5* rotates in bearings *8 8'*, secured to the sides of the underframe *r*, which supports the weight of the rear portion of the vehicle through the medium of laminated springs *9*. The sides of the underframe *r* have their forward ends jointed to bracket *11*, projecting down from the main frame *b*. Thus the vertical oscillations of the vehicle can take place without interfering with the driving-gearing, as the axle *5*, the bearings of the counter-shaft *w*, and shaft *p* being fixed to the underframe *r* are free to move up and down independently of the main frame, the motor and the other parts of the vehicle and the crank-shaft being connected to the axle-gear through universal joints.

The front part of the vehicle is carried on springs *13*, resting upon an axle *12*, which has pivoted arms, on which the front road-wheels *14 14'* rotate, and crank-arms *15 15'*, connected to each other by a rod *16*.

I preferably effect the steering of the vehicle by means of an inclined spindle *17*, carried in a bearing *18* and having a hand-wheel *19* at its upper end and on its lower end a worm *20*, gearing with a worm-segment *21*,

having fixed to it an arm 22, the lower end of which is connected by a rod 23 to an arm 24, fixed to one of the axle-pivots. By turning the hand-wheel the front axles are turned so  
5 as to steer the vehicle as desired.

Having thus described the nature of this invention and the best means I know of carrying the same into practical effect, I claim—

10 A road-vehicle propelled by steam, comprising a compound steam-motor having its two cylinders arranged diagonally at right angles to each other, and its pistons connected to one crank, pinions of different diameters arranged to slide on the crank-shaft into or  
15 out of gear with wheels of different diameters

on a longitudinal counter-shaft connected through universal joints to bevel-gear working differential gear on the axles of the driving-wheels, the bevel and differential gear and driving-axle being mounted on a frame 20 having on its rear end springs and at its front joints connecting it to the main underframe, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses. 25

SIDNEY STRAKER.

Witnesses:

ERNEST CLARE,  
R. HALL.